

REMARKS

Claims 1-22, and newly added claim 23, are in the application, and are presented for examination. Claims 1-9, and 18-22 have been withdrawn from consideration, and Applicants intend to file divisional applications in the future. Claims 10 and 13 have been amended. No new matter has been added by virtue of the amendments to claims 10 and 13. Claim 10 has been amended by including matter that was present in the originally filed application. In more detail claim 10 was amended as follows:

(a) The polydispersity index is now recited as between about 1 and 10. Support for this is found at page 3, lines 12-13;

(b) An editorial change was made to delete "alkenyl," and substitute therefor, --- alkenylbenzene ---. Support for this change is readily found throughout the entire specification;

(c) The word "more" has been deleted, and replaced by a ratio of second monomer units to first monomer units. Support for the ratio is found at page 7, lines 6-8, of the specification as filed; and

(d) The nanoparticle compositions are described as having a size distribution that is polymodal. Support for this is found in the specification, as filed at page 7, lines 14-16, page 2, lines 21-22, and page 4, lines 18-19.

The amendments to claim 13 involve insertion of the correct sign for alpha. Support for this change is found at page 10, lines 3-5 of the specification as filed.

Newly added claim 23 is supported by page 5, lines 3-4 of the application as filed.

ELECTION/RESTRICTION

Applicants elect to prosecute the invention of Group II, claims 10-17. This election is made without traverse. The Examiner indicates that a provisional election was made by Applicants. Applicants respectfully withdraw the previously made traverse of the Examiner's restriction.

As indicated by the Examiner, claims 1-9, and 18-22 are withdrawn from further consideration, under 37 CFR 1.142(b), as being drawn to a non-elected invention.

REJECTIONS UNDER 35 USC 112

The Examiner has rejected claims 10 and 13, under 35 USC 112, second paragraph, as being indefinite.

More particularly, the Examiner has indicated there is no definition for the formulation of diblock polymer chains. This is based upon the Examiner's interpretation of claims 10 and dependent 13, indicating that the outer layer of section (a) can be an alkenylbenzene, and the inner layer of section (b) can also be an alkenylbenzene. From this the Examiner concludes that the resulting nanoparticle might not include any diblock polymer chains.

In view of present claim 10, and claim 13 that is dependent on claim 10, Applicants contend that this interpretation of the Examiner is not possible. As is evident, claim 10 requires that the novel nanoparticle compositions include BOTH MONO-BLOCK AND DIBLOCK POLYMER CHAINS. This feature is recited as a limitation on the nature of the nanoparticles being produced. It is, therefore, clear that one of ordinary skill would not read claim 10 as allowing an interpretation such that the nanoparticle being produced would not include diblock polymer chains.

If one of skill were to use as the outer layer a conjugated diene, or an alkylene, or a mixture of an alkenylbenzene, a conjugated diene, or an alkylene, as recited in section (a) of claim 10, and as the inner layer, an alkenylbenzene, there is formed, without doubt, nanoparticles that will have both monoblock and diblock polymer chains.

The situation hypothesized by the Examiner is not a possibility. If one were to use only an alkenylbenzene as the outer layer, and an alkenylbenzene as the inner layer, there could be monoblock chains only; there could not be any diblock. This is INCONSISTENT WITH THE CLAIMED INVENTION. As set forth in independent claim 10 and dependent claims 11 through 17, the

claimed polymer nanoparticle compositions MUST INCLUDE BOTH MONOBLOCK AND DIBLOCK POLYMER CHAINS. This requirement for the nanoparticles is not merely preamble language; rather, the requirement that the nanoparticles include both monoblock and diblock polymer chains is a distinct limitation on the claimed invention.

In view of the above, Applicants content that a proper reading or interpretation of claims 10-17, would preclude the use of an alkenylbenzene solely as the outer layer, such that the nanoparticles would not include diblock polymer chains. The correct interpretation of claims 10-17 is that the use of an alkenylbenzene as the outer layer could only occur where used in a mixture with a conjugated diene or an alkylene, such that the nanoparticles would contain both monoblock and diblock polymer chains.

Applicants therefore, content that there is nothing indefinite in claims 10 and 13 regarding the required presence of diblock polymer chains.

The Examiner has also indicated that the phrase "more of said second monomer units than said first monomer units," is indefinite as a result of using the word "more." Claim 10 has been hereby amended to replace the use of the word, "more," with a specified ratio of the first and second monomer units.

Accordingly, Applicants respectfully request that the Examiner withdraw the rejection of claims 10 and 13, under 35 USC 112, second paragraph, as being indefinite.

REJECTION UNDER 35 USC 102(b)

The Examiner has rejected claims 10-15, and 17, under 35 USC 102(b), as being anticipated by U.S. Patent No. 6,437,050 to Krom et al. Applicants respectfully traverse this rejection for the following reasons.

Independent claim 10 has been hereby amended to be patentably distinguished from Krom et al., as well as to more correctly recite the polydispersity index values, and to remove use of the word "more." The attention of the Examiner is directed to Applicants' insertion into claim 10 of the limitation that the nanoparticles must have a size distribution that is polymodal.

The originally filed specification supports the limitation regarding the nanoparticles of the present invention having a size distribution that is polymodal. For example, at page 7, lines 14-16 of the specification, it is stated that at least a bimodal nanoparticle size distribution is obtained by the present invention. Further, at page 4, lines 18-20, it is stated that the size distribution of the nanoparticles may be bimodal, trimodal, quadramodal, and the like. This feature is also shown by the GPC analysis of Example 4, which indicated that the nanoparticles had two (2) average molecular weights (M_n). The GPC for the nanoparticle of Example 4 is part of the application as filed.

The Krom et al. patent does not disclose or suggest a nanoparticle that has a size distribution that is polymodal. Nor is there any reason to expect that the nanoparticles of Krom et al. would be, or could be, polymodal.

Indeed, the process for forming the polymer nanoparticles of Krom et al. differs from the process of the present invention that may be used to prepare the novel nanoparticles having a size distribution that is polymodal. For example, in the present application, a diene monomer, for instance, is polymerized with excess alkenylbenzene monomer TO FORM MONOBLOCK AND DIBLOCK POLYMERS, which are then formed into micelles of the monoblock and diblock polymers, that are crosslinked to form the nanoparticles. The Krom et al. process differs, for example, in that as shown clearly in claim 9, the process requires polymerizing an alkenylbenzene monomer and a diene monomer to FORM A DIBLOCK POLYMER, which is formed into micelles and then crosslinked.

It is Applicants' expectation that since the present process differs from the Krom et al. process, the products resulting from the processes will also differ. Therefore, Applicants' claimed nanoparticles are patentably distinct from the nanoparticles of Krom et al., and Applicants respectfully contend that claims 10-15 and 17 of the present application are not anticipated under 35 USC 102(b) by Krom et al., U.S. Patent No. 6,437,050. Applicants respectfully request withdrawal of this rejection by the Examiner.

Rejection under 35 U.S.C. 103(a) over
U.S. Patent No. 6,437,050 in view of
U.S. Patent No. 5,399,629

The Examiner has rejected claim 16 under 35 USC 103(a) as being unpatentable over Krom et al., U.S. Patent No. 6,437,050 in view of Coolbaugh et al., U.S. Patent No. 5,399,629. Applicants respectfully traverse this rejection for the following reasons.

The Examiner has stated that Krom et al. do not disclose hydrogenating conjugated diene monomer units. The Examiner states that Coolbaugh et al. discloses hydrogenation of copolymers based on conjugated diene monomers, and that it would have been obvious to combine Krom et al. with Coolbaugh et al.

Claim 16 is dependent upon claim 10, and, accordingly, includes all the limitations of claim 10. As a result, for all the reasons provided herein, amended claim 10 is not unpatentable in respect of Krom et al. Thus, claim 16, dependent on claim 10, is also not rendered unpatentable by a combination of Krom et al. in view of Coolbaugh et al.

Accordingly, Applicants respectfully request the Examiner to withdraw the rejection of claim 16 as being unpatentable under 35 USC 103(a), over Krom et al., U.S. Patent No. 6,437,050 in view of Coolbaugh et al., U.S. Patent No. 5,399,629.

DOUBLE PATENTING

The Examiner has rejected claims 10-17 on the ground of obviousness-type double patenting, as being unpatentable over claims 1-18 of U.S. Patent No. 6,872,785 to Wang et al. Applicants respectfully traverse this rejection for the following reasons.

The Examiner has stated that claims 1-18 of the Wang et al. patent, while not identical with the claims of the present application, are not patentably

distinct. The Examiner further states that the claims 1-18 of Wang et al. directly overlap the presently claimed nanoparticle.

However, with respect to the presently amended claims, Applicants contend that the obviousness-type double patenting rejection is not applicable.

Presently amended claim 10 requires that the nanoparticles have a size distribution that is polymodal. There is no disclosure or suggestion in claims 1-18 of Wang et al. regarding a nanoparticle of the type claimed that has a size distribution that is polymodal.

Accordingly, Applicants content there is no requirement for a terminal disclaimer to be filed. Furthermore, the Applicants respectfully request the Examiner to withdraw the rejection of claims 10-17 on the ground of obviousness-type double patenting as being unpatentable over claims 1-18 of U.S. Patent No. 6,872,785 to Wang et al.

**REJECTION UNDER 35 USC 103(a)
OVER U. S. PATENT NO. 6,872,785**

The Examiner has rejected claims 10-17, under 35 USC 103(a) as being obvious over Wang et al., U.S. Patent No. 6,872,785.

In this instance, the Examiner has not directed Applicants' attention to the particular portion of the Wang et al. reference that should be considered in regard to the rejection. Applicants will not speculate on the basis for the rejection. However, Applicants respectfully traverse the rejection of claims 10-17, under 35 USC 103(a) as being obvious over Wang et al. for the following reasons.

Applicants have hereby amended claim 10 to recite that the nanoparticle MUST HAVE A SIZE DISTRIBUTION THAT IS POLYMODAL. This aspect of a polymodal size distribution is not disclosed or suggested by Wang et al.

The Wang et al. patent, as reflected in the claims, is directed to a multi-layer polymer nanoparticle, wherein the nanoparticles have a mean average diameter of less than about 100 nm. All of the independent claims 1, 14, and 19 of Wang et al. include the limitation that the nanoparticles have a mean average diameter of less than 100 nm. Obviously, the main points of the

patent are directed to a nanoparticle that is multi-layered and has a mean average diameter of less than about 100 mm.

The above are the essential requirements to be possessed by the nanoparticles of Wang et al. With this in mind, it is understandable that Wang et al. were not interested in, and did not disclose Applicants' claimed invention related to nanoparticles having a polymodal size distribution. Moreover, since the focus of Wang et al. was directed to nanoparticles having multi-layers, and being of a mean average diameter less than about 100 mm, there would have been no reason for Wang et al. to disclose or suggest nanoparticles having a polymodal size distribution.

In Applicants' view then, claims 10-17 are not obvious over Wang et al., U.S. Patent No. 6,872,785. Accordingly, Applicants respectfully request the Examiner to withdraw the rejection of claims 10-17 under 35 USC 103(a) as being obvious over Wang et al.

INFORMATION DISCLOSURE STATEMENTS

The Examiner has noted that Applicants have submitted Information Disclosure Statements listing 162 references. The Examiner has requested Applicants to identify the relevance of each of the cited documents.

MPEP 609.04 (a) describes the content requirements for an Information Disclosure Statement. In subsection III, it is indicated that the requirement for a concise explanation of relevance is limited to information in the IDS that is not in the English language. In the last paragraph of subsection III, it is stated that a concise explanation of the relevance of the information is not required for English language information. Applicants are only encouraged to provide a concise explanation of the relevance of English language information that is submitted. There is, however, no obligation to explain the relevance of any English language information that is submitted.

Accordingly, Applicants respectfully decline the Examiner's request to explain the relevance of the English language information that has been submitted.

CONCLUSION

Applicants believe the application is in condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the rejections that are outstanding. Applicants submit that claims 10-17 are patentable, and, accordingly, request the Examiner to pass the application to issue.

Respectfully submitted,



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